

# Automation

Tailored solutions from a single source.

**EFFICIENCY IN MOTION.**

Together we will create your tailored automation solution, encompassing everything from analysis and planning to implementation, service and support.

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**PLANNING & CONFIGURATION.**

We will work with you to plan and configure the perfect logistics solution for your needs.

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**IMPLEMENTATION & SYSTEM INTEGRATION.**

When it comes to implementing your automated warehouse, we offer all intralogistics functions from a single source and, as a general contractor, ensure pinpoint accuracy at all times.

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**SERVICE & SUPPORT.**

Once your logistics system is up and running, we are always ready to hand when you need us – even round the clock if necessary.

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**AUTOMATIC PALLET STORAGE.**

Be it automated high-rack stackers in narrow aisles or an automated pallet warehouse with stacker cranes: maximum performance is guaranteed – even round the clock if necessary.

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**AUTOMATIC SMALL PARTS STORAGE.**

Enjoy highly efficient and customised small parts storage for your business and benefit from the most powerful Miniload in its class.

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**CONVEYOR SYSTEMS.**

Pallet and case conveyor systems enhance your warehouse productivity – be it for modernisations or completely new systems.

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# Efficiency in motion.

## Automation with Jungheinrich.

Together we will plan and develop the perfect logistics solution for your needs, based on the extensive experience we have gathered working with companies of varying sizes in numerous sectors.



Thanks to our unique, comprehensive service network, we will remain at your side even after your logistics system is up and running.

We are masters of all aspects of automation – from analysis and planning to implementation, service and support of turnkey solutions. We will work with you to raise your efficiency and productivity to a whole new level by making your warehouse fit for the future.

When it comes to implementing your automated warehouse, we offer everything from a single source. As a general contractor, we will link all components together to form a complete system, all the while ensuring pinpoint accuracy.

# Planning & configuration.

Together we will identify the optimum automation level for your needs, based on material flow analyses and your specific objectives.

In creating the perfect solution for your requirements, we can call upon extensive experience gained with companies of varying sizes in many different industries. As early as the rough planning phase, we will analyse and compare different potential solutions. During fine planning, we will work together to devise the optimum system. In doing so, we will also allow for flexible expansion and adaptation of your automated warehouse, thereby ensuring long-term sustainability.

- ▶ Optimum organisation of your warehouse processes.
- ▶ International experience in a wide range of industries.
- ▶ Tailored solutions with an individual level of automation.

**New systems:**

Custom solutions which are tailored to your exact requirements and allow for future growth as well as optimum scalability.

**Modernisation and optimisation:**

The perfect answer to increasing demands for efficiency and capacity.







With the aid of material flow analyses, system visualisations or CAD layouts, we make actual and target states transparent and uncover optimisation potential.



Our project management expertise for tailor-made intralogistics solutions ensures that your project runs smoothly and professionally.

# Implementation & system integration.

As a general contractor, we maintain a complete overview at all times. We ensure that your project runs smoothly and that your solution is implemented with pinpoint accuracy.

When it comes to implementing your automated warehouse, we offer everything from a single source. This ensures a high degree of transparency and security throughout the entire project, culminating in the handover of your turnkey system. With one partner overseeing all aspects of your solution, you can be sure that all systems – be they manual, partially or fully automated – work together in perfect harmony. This applies equally to newly installed as well as existing warehouse components and IT infrastructures.

- ▶ Professional general contractor with one contact person for all systems and services.
- ▶ Reliable and transparent project management throughout all phases of implementation.
- ▶ Handover of the turnkey system following its acceptance.



**Building, structural steelwork, racking system:** We employ the right construction method for every warehouse type, while taking all relevant factors into account.

**Trucks and automated components:** Our portfolio includes all the essential elements for your automated warehouse – ranging from manual to fully automated products.

**Software and IT systems:** We also take care of the digital networking of your warehouse.

# Service & support.

Following project completion, we are always at your side with a unique customer service network that is unrivalled in the industry.

With more than 5,000 service engineers, we are always on hand to ensure flawless operation of your system. This includes all necessary maintenance, safety checks and inspections – on a 24/7 basis if required. Important spare parts are always on-site, allowing us to reduce potential downtimes within your logistics system to an absolute minimum. To prevent expensive repairs, we can train your employees in the efficient and safe operation of your system and can also assume responsibility for the system monitoring.

- ▶ Minimisation of downtimes thanks to on-site availability of spare parts.
- ▶ Regular maintenance and inspection extends the service life of your system.
- ▶ Telephone support available up to 24 hours a day, 365 days a year.
- ▶ Full cost control thanks to individual service level agreements.

**Service:** Global, cost-transparent and reliable. For minimal downtimes and a long system service life.

**Support:** We provide comprehensive support to ensure smooth, uninterrupted processes. This encompasses everything from system monitoring to employee training.







Our service engineers conduct professional maintenance, inspections, safety checks and repairs to ensure reliable 24/7 operation.

# Automatic pallet storage. Efficiency at the highest level.

Maximum performance in multi-shift operation, up to 24 hours a day – with automated high-rack stackers or stacker cranes.

## AUTOMATIC PALLET WAREHOUSE

Equipped with stacker cranes, these warehouses are the ideal solution when storing and handling large numbers of pallets in multi-shift operation. They can be implemented as integrated or free-standing silo warehouses with heights of up to 45 metres. This ensures optimum utilisation of the available space. The warehouses are suitable for all manner of goods – be it in single-, double- or multi-depth format, with normal temperature storage, as temperature-controlled warehouses or as deep-freeze systems down to  $-35^{\circ}\text{C}$ .

## AUTOMATED NARROW-AISLE WAREHOUSE

Automated guided vehicles are our key players when it comes to automated storage and retrieval as well as order picking in narrow-aisle warehouses. The vehicles are based on our tried-and-tested serial trucks, which have been enhanced with automatic components. Incremental automation allows you to keep your options open for the future. Thanks to our warehouseNAVIGATION, even semi-automation can boost throughput performance by up to 25 percent. It is also possible to supply the necessary power via rack-mounted busbars – for round-the-clock efficiency and performance.

- ▶ Maximum throughput in multi-shift operation up to 24 hours a day – with stacker cranes or automated high-rack stackers.
- ▶ Optimum space utilisation with storage at heights of up to 45 metres (stacker cranes) or 13 metres (high-rack stackers).



**Stacker crane for pallets:** speed and precision during storage and retrieval process.



The **ETX 515a** is well equipped for manual, semi-automatic or fully automatic deployment. Incremental automation is also possible.





For lift heights of up to 13 m and 1,600 kg capacity.

24/7 operation is also possible via busbars.

Based on reliable serial trucks, enhanced with **automatic components**.

**SERIES**

Model name	516a
Lift height in mm	4,780–13,000
Capacity in kg	1,400–1,600
Travel speed in km/h	10.5–12

**EKXa**

Model name	515a
Lift height in mm	3,000–13,000
Capacity in kg	1,200–1,500
Travel speed in km/h	9

**ETXa**

Model name	515a
Lift height in mm	3,000–13,000
Capacity in kg	1,200–1,500
Travel speed in km/h	9



**Flexible scalability**  
up to 25 m thanks to  
modular construction.

**Optimum space utilisation**  
with the lowest approach  
dimensions in its class.

**Optimum goods throughput**  
thanks to top performance data:  
> 6 m/s speed and > 5.3 m/s<sup>2</sup>  
acceleration.

**Maximum energy efficiency**  
with brake energy storage in  
SuperCaps.

The most powerful Miniload is perfectly integrated in a complete system comprising the racking, conveyor technology and software.



# Automatic small parts storage. As individual as your business.

Speed, precision, optimum energy efficiency and maximum space utilisation – backed up by the most powerful Miniload in its class.

## AUTOMATIC SMALL PARTS WAREHOUSE

Automatic small parts warehouses (ASW) are as individual as your requirements. They enable extremely space-saving storage of small parts in containers, boxes or trays. Your goods are stored on angular supports or shelves – making full use of the space up to a maximum of 25 metres. The load capacity extends up to 300 kg. At the heart of the system is the Jungheinrich Miniload, developed by us in-house, which impresses with best-in-class performance data for rapid access times, optimum space utilisation and maximum energy efficiency.

## DYNAMIC SMALL PARTS WAREHOUSE

When it comes to maximum throughput performance in a highly restricted space, we can provide the optimum solution for all applications – be it as drive-through racking following the first-in-first-out (FIFO) method, as paternoster racking or in the form of vertical lift racking.


- ▶ Maximum throughput performance with speed and precision.
- ▶ Optimum space utilisation with highly space-saving storage in containers, boxes or trays.
- ▶ Utmost efficiency thanks to perfect interaction of all components.



At the heart of the system is the powerful **Miniload**. Benefit from unrivalled space utilisation, goods throughput and energy efficiency.



**Lift racking** for efficient, custom-made storage with a small footprint.



**High efficiency and process reliability** for each and every load unit.

**High throughput performance** with an efficient flow of goods.

**Custom-made** thanks to a wide range of materials handling components.

Conveyor technology opens up new possibilities in the field of warehouse automation and ensures highly efficient intralogistics processes.

# Conveyor systems. Fast and efficient movement of goods.

**Innovative pallet and case conveyor systems,  
tailored to your individual requirements.**

## **PALLET CONVEYOR SYSTEM**

Thanks to its modular design, our pallet handling technology can be tailored precisely to your material flow requirements. Be it roller or chain conveyors, shuttle cars, lifting or rotary tables: efficiency and productivity are always the main focus when it comes to selecting the right components.

## **CASE CONVEYOR SYSTEM**

Automatic case conveyor systems are the key to intelligent warehouse automation. The focus here is on the conveying, sorting, inward and outward transfer as well as the buffering and storage of goods. In conjunction with the Jungheinrich Warehouse Management System, this allows you to raise your material flow to a whole new level.

- ▶ Highly efficient material flow with connection to fully optimised intralogistics processes.
- ▶ Adaptable and tailored to suit all requirements thanks to modular construction.
- ▶ Cost-effectiveness ensured by low maintenance requirements and high energy efficiency.



**Pallet conveyor system** with high transport speeds for maximum throughput performance.



**Case conveyor system** for transporting products in boxes, containers and trays weighing up to 50 kg.



# Automated Guided Vehicles. For efficient material flow – even in mixed operation.

Based on tried-and-tested serial trucks and controlled by intelligent software, Automated Guided Vehicles are the beating heart of an automated warehouse.

## AUTOMATED TRUCKS

These trucks are based on sophisticated serial trucks, which have been enhanced with automatic components. They complete recurring transport tasks in your warehouse fully automatically and with utmost precision and process reliability. The personal protection sensors, a key component of these trucks, feature warning and protection fields which permanently monitor the direct travel routes. This enables trouble-free use of the automated trucks in mixed operation with manual trucks. To pre-empt any operational disruptions, our Automated Guided Vehicles (AGV) undergo rigorous preparation and extensive hardware and software tests before being delivered to the customer. On-site, your Automated Guided Vehicle system is seamlessly integrated into your existing system landscape via the award-winning Jungheinrich Logistics Interface. This makes the implementation of your AGV a highly efficient process.

- ▶ High efficiency in multi-shift operation with lithium-ion power.
- ▶ Laser navigation ensures that every rack position is approached with millimetre precision.
- ▶ Comprehensive safety sensors for use in mixed operation.



With its compact design, the **ERC 213a** is ideal for transport tasks in tight spaces.



The extended forks of the **ERE 225a** enable simultaneous transport of multiple pallets.



The **EKS 215a** features adjustable forks for maximum flexibility in terms of load configuration and station layout.



Navigation of the Automated Guided Vehicles is based on tried-and-tested, **high-precision laser navigation.**

The **EZS 350a** is the automated tow tractor for optimised transport routes in warehouses and for production supply.

**Maintenance-free but extremely powerful:** lithium-ion technology for our Automated Guided Vehicle systems.



SERIES	ERCa	EKSa	EREa	EZSa
Model name	213a	215a	225a	350a
Lift height in mm	3,100	3,500–6,000	122	–
Capacity in kg	1,300	1,500	2,500	5,000
Travel speed in drive direction in km/h	7	7–9	6.1	8–12.5

Maximum safety thanks to **comprehensive safety sensors** – even in mixed operation and at high speeds.



# Order picking & palletising. Ideas for greater productivity.

Innovative technologies facilitate the order picking process, increase picking rates and reduce the number of errors.

## APPLICATION AREAS

Our efficient order picking solutions deliver a significant performance boost in your warehouse. From full pallet dispatch to the smallest lot sizes in e-commerce. The uncomplicated systems are intuitive to use and increase productivity by a significant margin.

## PICK-BY-VOICE & PICK-BY-LIGHT

With pick-by-voice, your employees have their hands free at the picking locations thanks to intelligent voice control. Pick-by-light also ensures faster processes in the warehouse with paperless order picking. The quantities to be removed are displayed directly at the relevant location.

## ROBOTIC PICKING

When it comes to highly efficient provisioning of pallets, the range of fully automated systems encompasses everything from simple layer palletisation to the creation of complex mixed pallets. Depending on the application, the optimum robot and gripping technology is used to ensure maximum performance.

## INTUITIVE ASSISTANCE SYSTEM

The intuitive easyPILOT remote control further increases the performance of our best-in-class ECE order picker. The mobile control system is connected to the truck via NFC and automatically directs it to its destination. This allows the operator to devote his full attention to the order picking process.

- ▶ Maximum throughput performance thanks to perfect, time-efficient picking.
- ▶ Systems to suit all needs – from intelligent support for human order pickers to order-picking robots.
- ▶ Innovative technologies for a future-proof warehouse.



The **easyPILOT mobile control system** approaches the next picking location safely and intuitively, thus greatly assisting the operator.



Depending on the individual application, optimum **robot and gripping technology** is used to maximise picking performance.

Aided by **intelligent voice control**, your employees can keep their hands free at the picking locations.

**Reduction of error rate** with accurate, spoken user guidance.

Thanks to innovative speech recognition technologies, **pick-by-voice** is easy to use by any operator.



# Satisfied customers. In all sectors.

We have been implementing automation projects with great success for many years – on a global scale and tailored to the needs of our customers.

## RETAIL | WHOLESALE

### E-COMMERCE, WITH AUTOMATED EFFICIENCY.

In the world of online retail, there is one simple rule: the shorter the delivery times, the happier the customer. Yet this places an additional strain on personnel. Unless, of course, you employ Automated Guided Vehicles for longer transport distances – up to 500 metres in this case. We implemented precisely this efficiency-boosting solution for one of the world's leading online retailers. The result: employees can now focus on more productive activities, and the investment paid for itself within a single year.



A palletising robot provides welcome relief when you are at peak capacity.

### CAPACITIES EFFECTIVELY DOUBLED.

A leading service provider for C parts management was searching for the most efficient way to handle the overwhelming diversity of stocked items. Our solution: a fully automated distribution centre with a high-bay pallet warehouse and two automatic small parts warehouses for boxes and trays. A palletising robot reduces the employee workload and ensures that even very large, unexpected orders are welcomed with a can-do attitude.

## LOGISTICS

### SEAMLESS ORDER TRACKING.

Whenever a spare or wear part is required for a Jungheinrich premium product, our customers worldwide can trust in a rapid resolution – within a single day, on 365 days a year and across three continents. For this very reason, we focussed on a high degree of automation from the outset when designing and implementing our own spare parts warehouse in Kaltenkirchen. Across 22,000 square metres of storage space, pallets are accommodated at heights of up to 31 metres, while we can also call upon 80,000 container storage locations. In combination with customised conveyor technology and a sophisticated IT infrastructure, up to 1,000 spare parts per hour can be prepared for dispatch at lightning speed.



Ready for dispatch at lightning speed: highly efficient material flow with conveyor technology.





In compact storage systems, goods are transported by agile shuttles.

#### FOOD PROCESSING

### COMPACT STORAGE WITH HIGH FLEXIBILITY.

A safe and hygienic process, combined with cost-effective storage according to the FIFO principle: a recipe for success in the foodstuffs industry. Our customer was struggling to achieve the above with conventional drive-in racking, while also lacking the flexibility to cope with production peaks. Yet a solution was soon found in the form of a semi-automated multi-depth storage system. This system combines a space-saving channel rack with an agile shuttle that moves independently within the channel along with a forklift truck for servicing the shuttle. With this new solution, the customer now benefits from much greater storage density.

#### CHEMICALS | PHARMACEUTICALS



Reliable navigation in tight spaces: automated high-rack stackers.

### WHEN SPEED AND SAFETY ARE PARAMOUNT.

Consistent process reliability and maximum efficiency are the be-all and end-all in the chemical and pharmaceutical industry. This also applies to our customer, who must comply with strict standards according to "good manufacturing practices" (GMP). From the outset, it was clear that an automated narrow-aisle solution with ever-ready high-rack stackers was the only answer in this case. The process highlighted one of Jungheinrich's great strengths: the ability to remain flexible throughout all stages of construction. As a result, one of the aisles can now be easily retrofitted with a cold store, whenever the need arises.

### SMART PICK FOR A CHEMICALS CLIENT.

Our customer in the plastics industry attributed great importance to efficient space utilisation as well as straightforward access to each individual storage location. Both of these needs were addressed with a high-bay warehouse with double-depth storage and a stacker crane. Moreover, errors have been virtually eliminated thanks to automated processes. As a system integrator, we also supplied conveyor technology along with our Warehouse Management System and material flow controller.



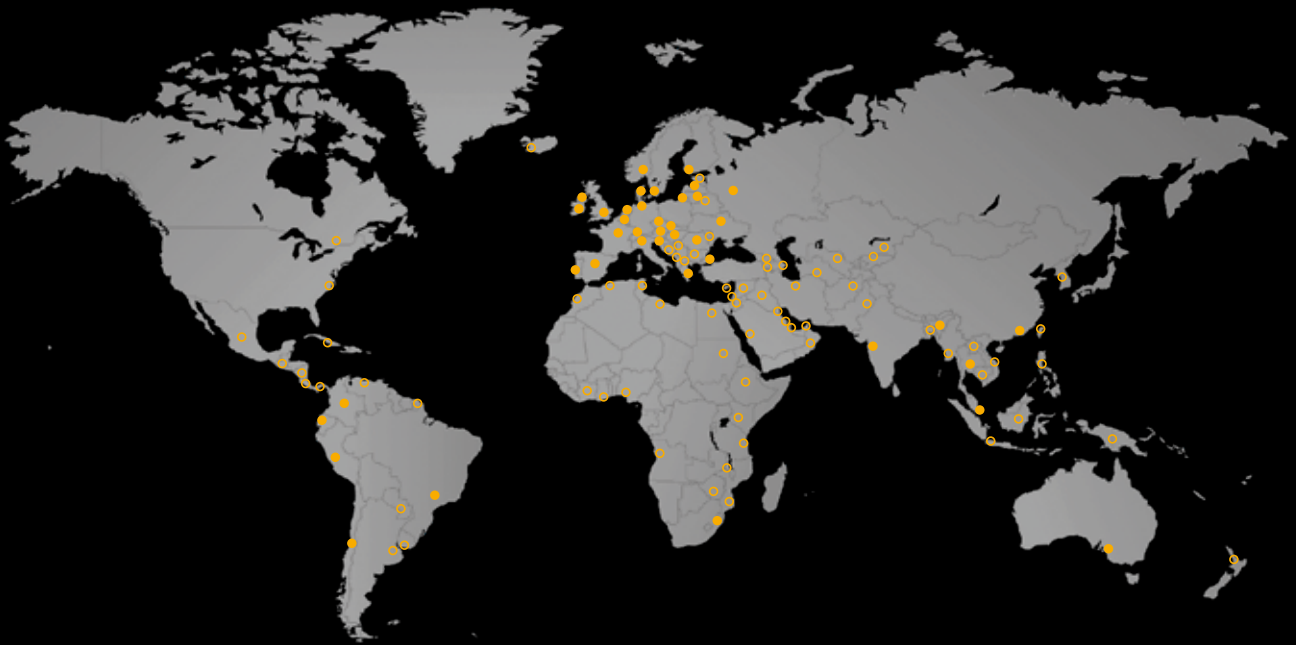
More space: stacker crane enables compact, double-depth storage.

#### INDUSTRY

### MAXIMUM PERFORMANCE IN A LIMITED SPACE.

Rapid growth is extremely desirable from a business perspective, but it poses a significant intralogistical challenge. This very situation was encountered by an Austrian metalworking company. With a two-aisle, double-depth high-bay warehouse as well as suitable stacker cranes, we rapidly implemented a sophisticated solution for reliable warehouse organisation. Manual and automatic processes are controlled centrally via the Jungheinrich WMS, while the material flows are also optimised. The result: transparency and efficiency.

# A leader in intralogistics. There for you across the globe.



● Our own direct sales  
companies in 40 countries.

○ Partner companies  
in more than  
70 other countries.

Over 18,000 employees.

More than  
5,000 service engineers  
across the globe.

Founded in 1953, Jungheinrich is one of the world's leading providers of intralogistics solutions. With a comprehensive portfolio of industrial trucks, logistics systems and services, we offer tailor-made solutions that allow you to devote your full attention to your core business. With our unique direct sales and service network, you can call upon a reliable partner who is at your side at all times, wherever you may be in the world.



### LOGISTICS SYSTEMS

Based on our extensive process knowledge and experience in a wide range of industries, we can also provide you with tailor-made logistics systems, ranging from manual to semi-automatic and fully automated solutions. We will thus work with you to raise your efficiency and productivity to a whole new level.



### NEW TRUCKS

Lifting, stacking, transporting, order picking – electrically, with combustion engines or by hand? Our product portfolio contains the perfect trucks for your needs.



### RENTAL

Forklift truck rental is not just an ideal solution for addressing short-term or seasonal requirements. Jungheinrich offers “power on demand” for all companies, regardless of their size or industry. We provide rental solutions for every requirement, with more than 60,000 trucks available worldwide for immediate use.



### USED TRUCKS

JUNGSTARS are used trucks from Jungheinrich, which are among the best on the market. With high-end reconditioning according to our 5-star principle, every truck is returned to an outstanding technical and visual condition to satisfy the highest safety and sustainability standards.



### DIGITAL SOLUTIONS

With intelligent software and sophisticated hardware components, we ensure complete digital networking within your warehouse. All processes can be monitored centrally and controlled with utmost efficiency. Systems from different manufacturers can also be integrated with ease.



### CONSULTING

Products and services must meet your exact requirements. That is why our consulting combines a high level of technical know-how with process knowledge and in-depth industry expertise. We can thus work together to identify the perfect complete solution.



### FINANCING

Jungheinrich Financial Services is your reliable partner throughout the entire life cycle of your Jungheinrich product. We offer individual solutions for trucks, racking, warehousing and system solutions, while taking your budget and the special requirements of your business into account.



### AFTER SALES

The trouble-free operation of your intralogistics solution is our top priority. That is why we offer reliable, global support for your trucks and systems with more than 5,000 qualified service engineers. This allows us to be on-site within a very short time frame to safeguard the high availability of your trucks and systems.

**ISO 9001** The German production facilities  
**ISO 14001** in Norderstedt, Moosburg  
and Landsberg are certified.

 Jungheinrich trucks  
conform to the European  
Safety Requirements.

### **Jungheinrich Aktiengesellschaft**

Friedrich-Ebert-Damm 129  
22047 Hamburg  
Germany  
Telephone +49 40 6948-0  
Telefax +49 40 6948-1777

info@jungheinrich.com  
www.jungheinrich.com

 **JUNGHEINRICH**